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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,163	02/28/2001	Dorit Wolf	WOLF, D. ET AL-1PCT	4075

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Collard & Roe
1077 Northern Boulevard
Roslyn, NY 11576

EXAMINER	
BROWN, JENNINE M	

ART UNIT	PAPER NUMBER
1755	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/786,163	WOLF ET AL.	
	Examiner	Art Unit	
	Jennine M. Brown	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/26/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-15 and 17* is/are pending in the application.

4a) Of the above claim(s) *4 and 11-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3, 5-10 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/17/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Election/Restrictions

Examiner previously restricted the invention under 25 U.S.C. 121, unaware of the application's status as a 371. The traversal on grounds that the prior European Classification of each of these elements is in the same IPC group is noted but the classification system used in the US Patent System is different than that used overseas. Applicant's continued traversal of the restriction in the response of 7/26/2004 as well as the cancellation of claims previously within the election/restriction of 6/17/2003 has necessitated the withdrawal of the election/restriction of 6/17/2003 and newly presented lack of unity of invention for clarity of the record the newly pending claims.

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claims 17, 3 and 5-10, drawn to A Method of Making a Catalyst, classified in class 502, subclass 152.

Group II, claim 4, drawn to Stochastic Fortran Algorithm as Random Check Generator, classified in class 341, subclass 109.

Group III, claims 11-15, drawn to Method of Using Catalyst in Multiple Catalytic Reactors, classified in 526, subclass 62.

The inventions listed as Groups I, II and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I lacks the Fortran algorithm of Group II and the reactor of Group III.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Active catalyst, selective catalyst, inorganic catalyst, organometallic catalyst, solid catalyst and non-solid catalyst.

Within this species, there is a sub species for solid catalyst as follows:

Chemical composition, weight composition, and catalyst properties.

Applicant is required, in reply to this action, to elect a single species and if solid catalyst is chosen to select the sub species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims

are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

The claims are deemed to correspond to the species listed above in the following manner:

The species are directed to the primary claim as amended.

The following claims are generic: claim 17, 3.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: some catalysts are solid materials, some catalysts are not solids but liquids, some catalysts are selective, some catalysts are active, some catalysts are inorganic, some catalysts are organometallic. For example, Ziegler Natta catalysts do not have the same composition or properties as Phillips catalysts, which do not have the same properties as alumoxanes which do not have the same properties as a metallocene. Each of these species of catalyst have would require their own search in a different area.

Applicant previously elected Group I (claims 2-3, 5-10 and 16 now claims 3, 5-10 and 17) in Paper 10. A new Group election with species is required and applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

Claim 17 is objected to because of the following informalities: The abbreviation "PTE" used in paragraph a) should be written in long hand assuming applicants mean the "periodic table of the elements". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 17 and 3-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

1. The claims are drawn to "a method for preparing" yet as written seem to be a "method of selecting" because no method steps are given on how to incorporate the materials "selected". Generally when a catalyst is made, definite groups of materials

are brought together to make a complex at some specified temperature and pressure. One skilled in the art would prefer an order of addition of materials either with or without a solvent used so that one would be able to determine an actual chemical composition made. According to the MPEP, "A process that consists solely of the manipulation of an abstract idea is not concrete or tangible. See *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). See also *Schrader*, 22, F.3d at 295, 30 USPQ2d at 1459." In this case, it does not appear that the method used is a concrete or tangible method. There is no definitive list of materials or concrete method of combination of materials therefrom to make a tangible composition, which would be used as a catalyst.

2. Claim 17 gives a method of "arbitrarily or randomly" preparing catalysts. The Merriam-Webster OnLine Dictionary defines at random as "without definite aim, direction, rule or method". Anything random would be questionable as to whether or not it is patentable subject material under 35 U.S.C. 101 because acts of nature are random and not patentable. Examiner is unsure how a catalyst could randomly be prepared with a method when the definition of random is that it lacks a method. The Merriam-Webster OnLine Dictionary defines arbitrary as "a) based on or determined by individual preference or convenience rather than by necessity or the intrinsic nature of something". This definition seems more appropriate for a method of preparing a catalyst because elements would be chosen and how to combine them would also be

chosen. Examiner therefore suggests that the term "randomly" be withdrawn from the claim language.

3. The terms "crossing" and "mutation" are used to modify the word "means", thus purporting to conform to 35 USC 112, sixth paragraph. However, 35 USC 112, sixth paragraph, requires that the terms specify a function to be performed, thus enabling a determination of the structural equivalent thereof. For example, expressions such as "latch means" or "means for latching" have functional connotations and are in conformity with the statute. However, in this case, the term has no functional connotations. See Ex parte Klumb, 159 USPQ 694. Although applicant may be his/her own lexicographer, it should not be contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "crossing" in claim 17 is used by the claim to mean "exchanging", while the accepted meaning is "(genetics) the act of mixing different species or varieties of animals or plants and thus to produce hybrids." The term is indefinite because the specification does not clearly redefine the term. The term "mutation" in claim 17 is used by the claim to mean "reduce or enlarge", while the accepted meaning is "a relatively permanent change in hereditary material involving either a physical change in chromosome relations or a biochemical change in the codons that make up genes". Both definitions used are related to

biological and biochemical materials not inorganic or organometallic catalyst materials and applicant's meaning came from the specification on pages 9-10 as directed by Applicant.

4. Claim 17 is drawn to stochastic methods of "random check generators, throwing dice and/or performing drawings" (e.g. lottery). It is unclear from the claim whether Applicants mean to claim a manual method of random check generators, throwing of dice and performing lottery drawings or whether a computer generated program which simulates a random-check generator, throwing of dice and performing lottery drawings are required.

5. It is unclear how one would go about physically making a catalyst from a method of throwing dice, performing lottery drawings or using a random check generator because method steps a) through l) do not state how the components selected are used with these methods. There is no statement such as "label each of the facia of the die with a different element selected from ..." which would give concrete and definite steps.

Claims Analysis

Applicants have traversed the statement that "... inorganic materials can neither be randomly nor arbitrarily crossed or mutated as they are non living materials." by arguing that "it is known in the state of the art to transfer the genetic algorithm from the field of living materials to non living materials" and that the terms crossing and mutation relate to bit strings in the response of 7/26/2004. Applicants are required to

supply evidence of his statement that it is known in the state of the art to transfer the genetic algorithm from the field of living materials to non living materials.

Examiner points out that the claims as written do not claim "bit strings" and do not refer to an algorithm, therefore the terminology is improper for one of ordinary skill in the art when referring to a catalyst composition or method of making or using a catalyst. The claims are drawn to a method of making a catalyst not a method of making, mutating or crossing bit strings. Should Applicants desire patent protection for such, claims should then be amended to reflect this.

The explanation given on pages 18 and 19 of the response of 7/26/2004 is an appropriate method for what is being claimed but the claims as written do not convey the actual method steps, therefore the claim language is improper.

Pages 1377 to 1386 of the "Handbook" are at present not available for viewing in eDAN and therefore cannot be commented on by the Examiner.

Although the specification highlights certain analytical methods, any method used to analyze a catalyst will be considered as appropriate to meet the limitation of claim 15.

Claim Rejections - 35 USC § 102/ Claim Rejections - 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner

to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 17 and 3-15 rejected under 35 U.S.C. 102(e) as being anticipated by or in the alternative under 35 U.S.C. 103(a) as being unpatentable over Petasis (US 6602817 B1).

See entire document. Petasis discloses a method for preparing active supported catalysts by selecting a metal from the group of B, Li, Mg, Al, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Mo, Ru, Rh, Pd, Ag, Re, Os, Ir, Pt, La, Ce and Yb (col. 2, l. 60-64) using parallel synthetic library creating sub pools of active compounds which are then tested (col. 2, l. 43-59). Product isolation is found by chromatography or distillation (col. 1, l. 63-65). Methods of making the catalyst are disclosed (col. 10, l. 34 – col. 11, l. 56). Although it is believed that the instant claims are inherently disclosed in Petasis, in the alternative it would be obvious to one of ordinary skill in the art to have created the library of compounds and determine whether these catalysts are active or selective based on a stochastic means for combining these materials because it is known in the art that the field of combinatorial chemistry requires that random combination of chemicals are used to generate a library array which consists of multiple combinations of materials which are combined in a "single pot" approach in order that a quick screening for activity and/or selectivity can be done where further modification to find out the particular reason for the activity and/or selectivity can be found and optimized.

Claims 17 and 3-15 rejected under 35 U.S.C. 102(e) as being anticipated by Kieken, et al. (US 6763309 B2).

See entire document. Kieken, et al. disclose a catalyst development engine which relies on a knowledge cycle, testing cycle and database. Figure 3a shows a model for specifying reactants, intermediates and products, generation of reaction mechanisms, screening, identification of critical kinetic parameters, testing and "success" and Figure 6 is a example of catalysts generated. Klein, et al. disclose it is known to perform random material discovery in the field of combinatorial chemistry (col. 1, l. 22 – 32) but that a rational approach using a knowledge driven process of integrated scientific and empirical modeling tools are used to build predictive models for selecting certain materials to scale up and produce catalysts that should have higher activity and/or selectivity (col. 1, l. 31-45). Kieken, et al. disclose the use of a Monte Carlo kinetic simulation which is a stochastic method of random number generation (col. 3, l. 4-9, 39-45; col. 12, l. 30-43). The catalyst development engine research process description is also disclosed (col. 5, l. 47 – col. 6, l. 50). Specific mathematical algorithms and models are used in several iterations to aid in the rational development of a catalyst which is active and/or selective by using chemical properties such as bond strength, site acidity, site basicity, oxidation potential or other chemical or physical property (col. 7, l. 41 – col. 8, l. 54; col. 14, l. 23 – col. 15, l. 38). Kieken, et al. disclose that the semi-empirical methods coupled with advanced machine learning methods to develop a potential set of lead catalytic systems which meet targeted properties (col. 8, l. 61 - 67). The testing cycle of a library of proposed materials is synthesized and evaluated (col. 25, l. 50 – col. 26, l. 3).

Claims 17 and 3-15 rejected under 35 U.S.C. 102(e) as being anticipated by Cawse (US 6728641 B1).

See entire document. Cawse discloses a method and system for selecting a best case set of factors for a chemical reaction, specifically a catalytic reaction as is shown in Figures 6 and 7. Cawse discloses that a researcher provides factors that may impact the reaction or process of intent such as reactants, solvents, carriers, catalysts and chemically inert substances (col. 3, l. 5-20) using a computer algorithm to relate these factors with a software program (col. 3, l. 20-39). There are multiple algorithms that can be used (col. 4, l. 40-65). High throughput screening results are envisioned as factors for input for the algorithm (col. 8, l. 64 – col. 9, l. 6). Catalyst metals used in the compositions are disclosed (col. 9, l. 61-64), cocatalyst, solvent, etc (col. 11 – 12, Table 5).

Claims 17 and 3-15 rejected under 35 U.S.C. 102(e) as being anticipated by or in the alternative under 35 U.S.C. 103(a) as being unpatentable over Deem, et al. (US 6640191 B1).

See entire document. Deem, et al. disclose in Figure 1 both a random number generator (a) and parallel tempering (b) as two different methods to create catalyst compounds as well as the relative figures of merit for each type of method used in Figure 3 to create an active and/or selective catalyst composition (col. 3, l. 11-49; col. 4, l. 5-9). Deem, et al. disclose random, quasi random or other number generators where a Metropolis algorithm is used with swapping, parallel tempering and a priori probability (col. 5, l. 30-61). The example given in example 2 gives a proof of principal

experiment using 4 metal components used in different combinations based on the different combinatorial methods (col. 13, l. 39 – col. 14, l. 41).

Claims 17 and 3-15 rejected under 35 U.S.C. 102(e) as being anticipated by Schultz, et al. (US 6420179 B1).

See entire document. Schultz, et al. disclose in Figure 8 a representative example of the quadrant based modified metals on a chip to determine whether or not superconductivity was present, using a metal oxide compound such as that in Figure 10A or 10B. Schultz, et al. disclose an array of diverse solids, such as covalent network solids, ionic solids, molecular solids for inorganic materials, intermetallic materials, metal alloys, ceramic materials, organometallic materials, composite materials (col. 1, l. 15 – 30; col. 6, l. 30 – col. 7, l. 35; col. 7, l. 59 – col. 8, l. 4). Schultz, et al. disclose approximately 100 elements in the periodic table which can be used to make compositions having 3 or more elements to generate large libraries and algorithms previously used for drug discovery (col. 1, l. 64 – col. 2, l. 49). Schultz, et al. disclose methods of screening the materials to determine activity and/or selectivity (col. 26, l. 65 – col. 27, l. 27; table 1, col. 28, l. 1-44).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 17 and 3-15 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of copending Application No. 09/909038. Although the conflicting claims are not identical, they are not patentably distinct from each other because both claim a process for producing new catalysts according to a method of restructuring the original catalyst by means of stochastic methods by crossing a randomly selected group of catalysts with multiple generations of progeny based on mutation to get active or selective variants. The instant application appears to be the species of the genus claimed in 09/909038.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennine M. Brown whose telephone number is (571) 272-1364. The examiner can normally be reached on M-F 8:00 AM - 6:00 PM; first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell can be reached on (571) 272-1700. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jmb

Mark L. Bell
Supervisory Patent Examiner
Technology Center 1700